

City of Benares
sailed 14/5/40
Dougherty

RETAIN

2

BARCLAY CURLES NO 656.

— PROFILE & DECKS —

"City of Benares"

GLASGOW REPORT No. 57455

"City of Benares"

GLASGOW REPORT No. 57571

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Lloyd's Register
Foundation

W369-0122

No 656
PROFILE & DECKS.

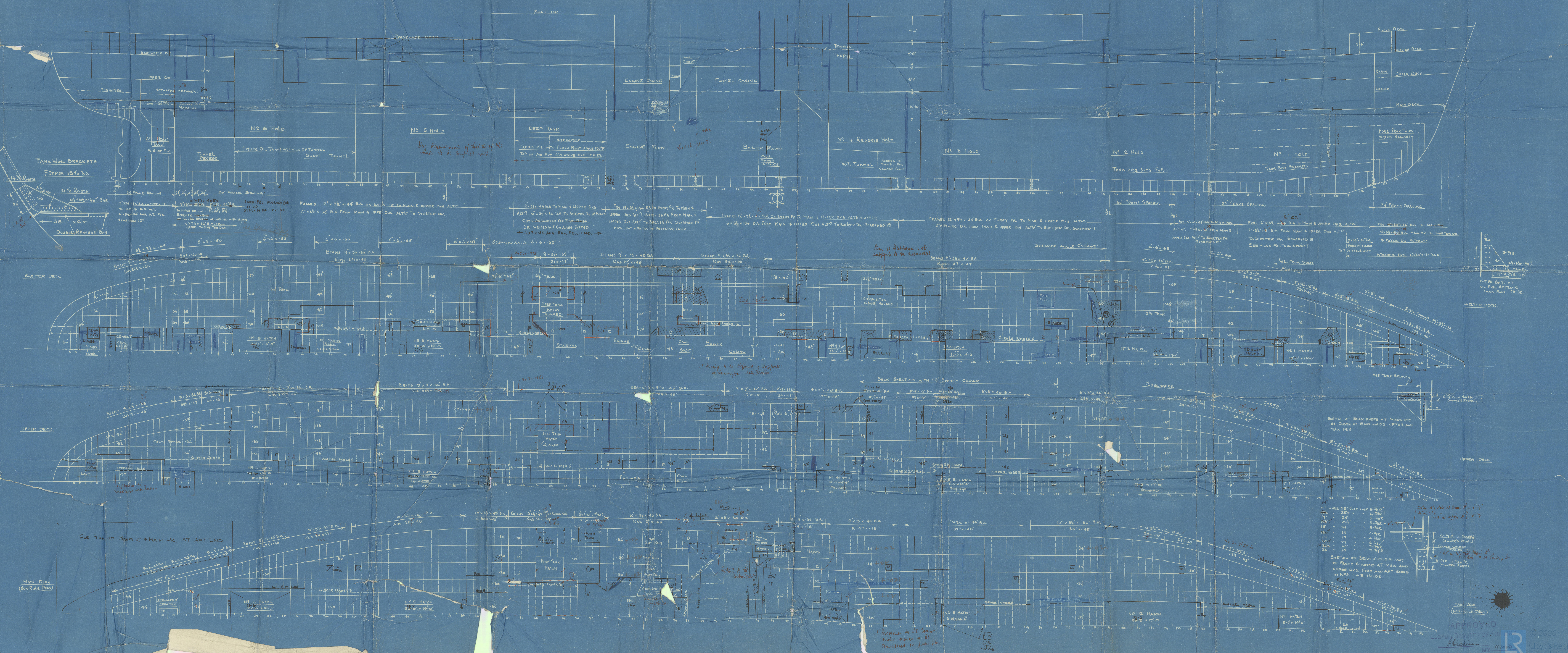
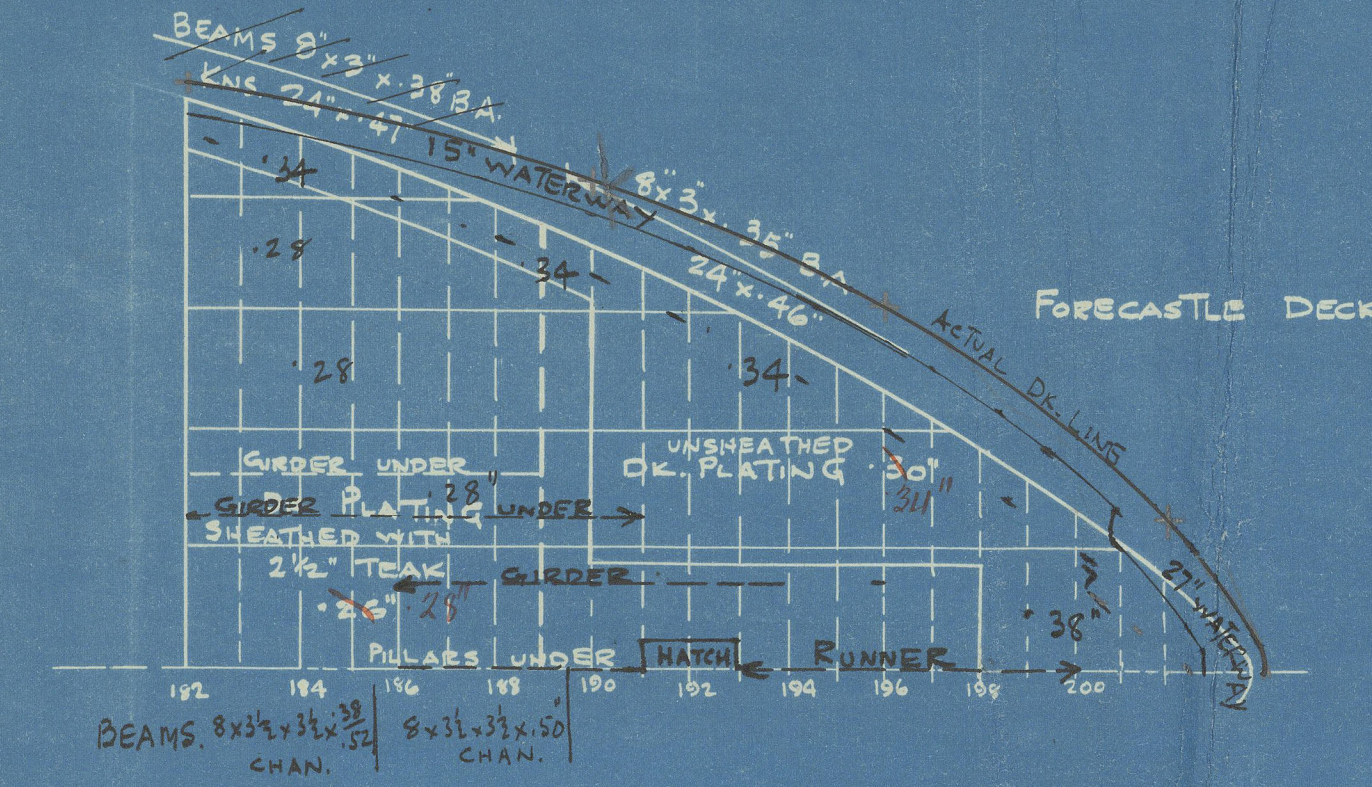
SCALE: 1" = 1 FOOT.

MOULDED DIMENSIONS: 473'-0" x 62'-4" x 43'-3 1/2" TO SHELTER DECK.
TO CLASS LLOYDS 100 A-1 WITH FREEBOARD CORRESPONDING
TO A SUMMER MOULDED DRAFT OF 28'-4".

PLAN No. 416.

SECTIONS ARE 1924 P.S.; MINIMUM THICKNESSES SHOWN ARE OBTAINABLE.
STAIRWAYS & STAIRWAY OPENINGS TO BE SUPPORTED
TO SURVEYOR'S SATISFACTION.

Windlass, which must be supported & braced in position.



34

Messrs. Barclay, Curle & Co. Ltd.

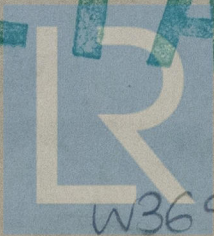
Yard No 656.

Profile & Main Deck at After End.

"City of Benares"

GLASGOW REPORT No. 57571

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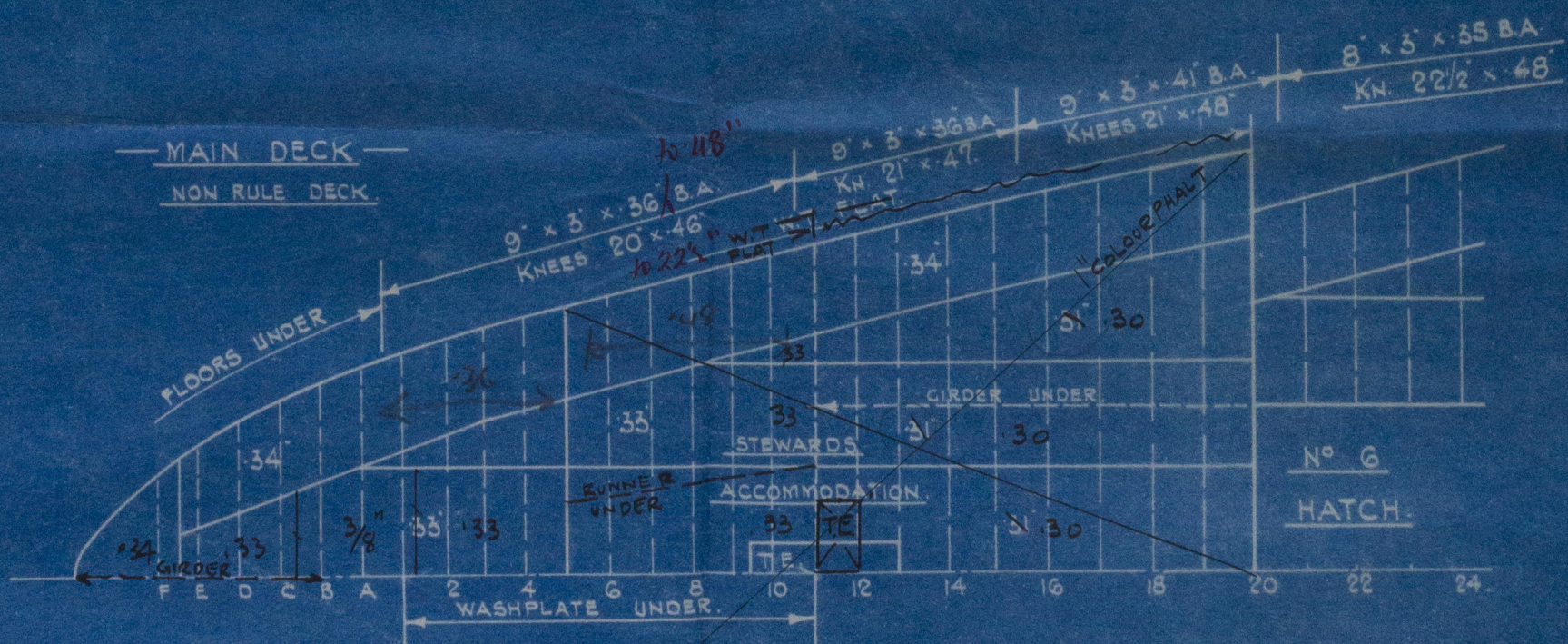
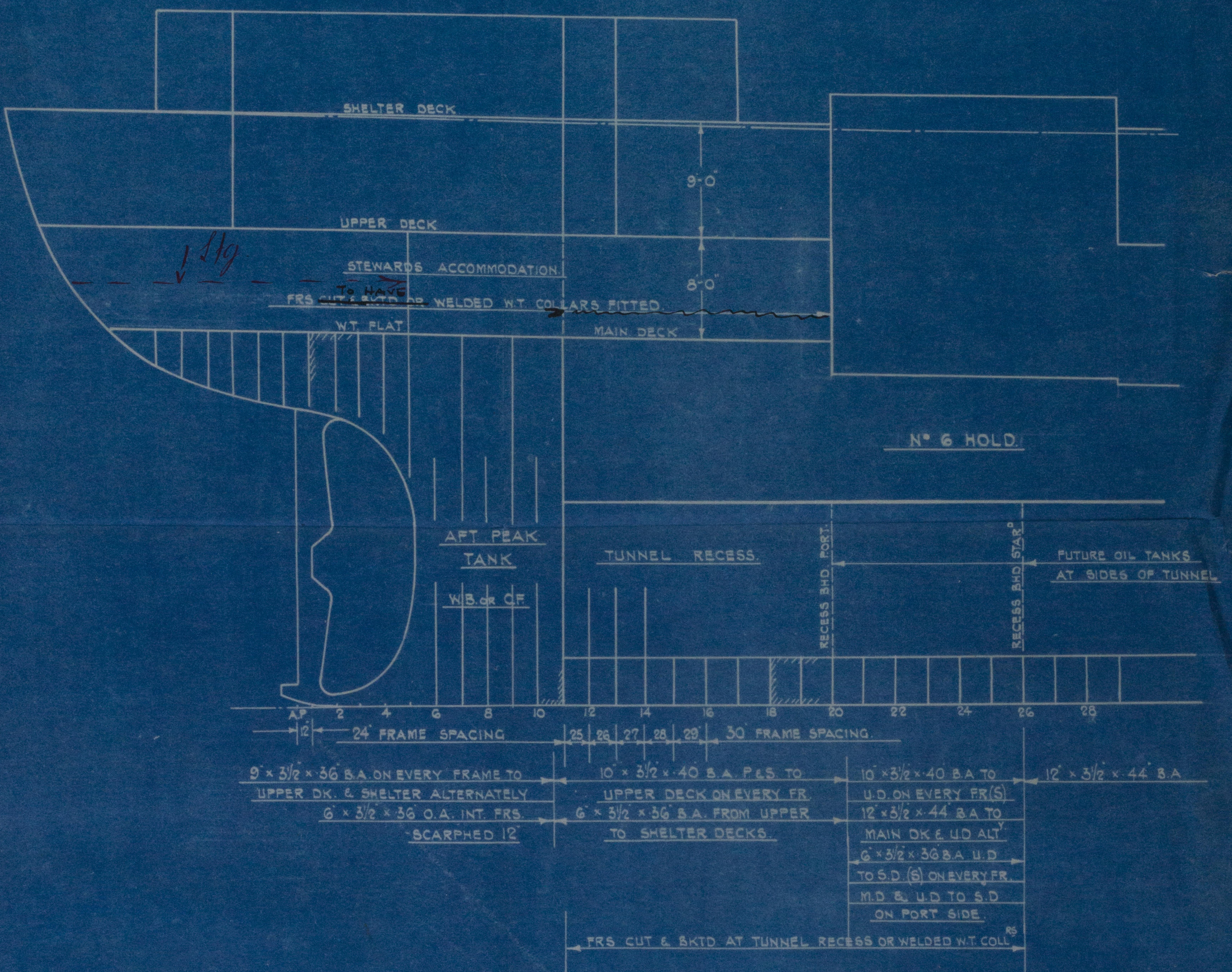
W369-0121

—N° 656.—



—PROFILE & MAIN DECK AT AFTER END.—

Scale: $\frac{1}{8}'' = 1 \text{ foot}$.



APPROVED
LLOYD'S REGISTER OF SHIPPING

Richardson



DATE 11/11/35

W369-0121

Lloyd's Register
Foundation

2
61

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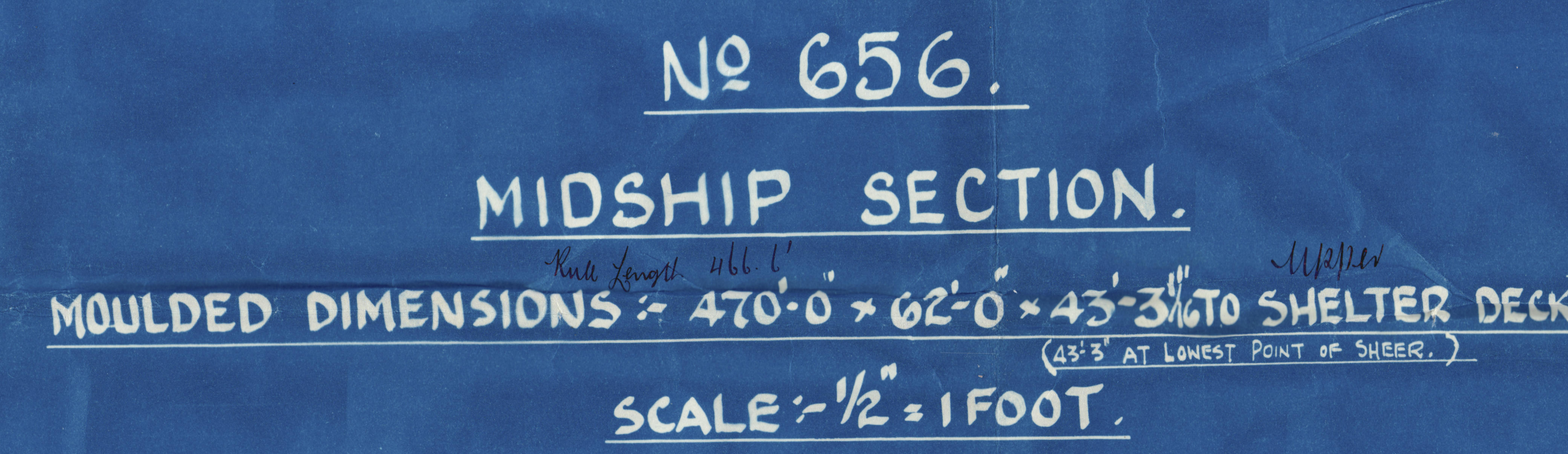
Yd. No 656

Midship Extension

City of Benares

GLASGOW REPORT No. 57571

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CRUISER STERN. LENGTH ON L.W.L. 483'-9"

LLOYDS NUMERALS

$L \times D = 470 \times 41.25$	$= 19387.5$
$L \times [B+D] = 470 \times [62 + 41.25]$	$= 48527.5$
D	$= 41.25$
L/D TO SHELTER DECK	$= 10.86$
$d = 23.506 - 3 - 0.91$	$= 19.51$

ALL SECTIONS SHOWN ARE NEW BRITISH STANDARD SECTIONS

FRAME SPACING.

24" IN PEAKS - 27" FORD. OF 3/4" L. FORD. TO COLLISION BULKHEAD.
30" APART ELSEWHERE. RULE SPACING 33 5/8" / 2

BEAMS AT EVERY FRAME

STEM $10\frac{5}{8} \times 2\frac{3}{4}$ STERNFRAME $11\frac{1}{8} \times 9$

RIVETING				
ITEM	END LAPS		EDGE LAPS	
	#/L	AT/END	#/L	AT/END
KEEL	4	4	2	2
SWELL STRONGS @ 2" P'	4	4	2	2
SWELL STRONGS @ 2" L'	4	3	2	2
SHEERSTRONGS "N"	4	3	2	2
STAKEBARS SHEERSTRONGS "M"	4	3	2	2
GOOTHS	3	3		
THICK TOP @ 2" STRONGS	3	2	2	1 W
THIN TOP PLATING	3	2	2	1 W
MARGIN PLATE	3	3	2	2
WALL DECK STRONGER	2	2	1	1
WALL DECK PLATING	1	1	1	1
UPPER DECK STRONGER	2	3	1	1
UPPER DECK PLATING	2	1	1	1
SPLITTER DECK STRONGER	2 W	3	2 W	1
SPLITTER DECK PLATING	3 W	2	1	1

✓ 4 WHERE EXCEEDING .68
 ✓ 3 WHERE EXCEEDING .48
 ✓ 2 WHERE EXCEEDING .48
 8. IN WAY OF OIL
 ✓ 1 WHERE ^{thick} NOT EXCEEDING .68
 ✓ 3 WHERE .60 THICK
 ✓ 2 ON PLATING INSIDE OPENINGS
 ✓ 1 WHERE NOT EXCEEDING .42 THICK

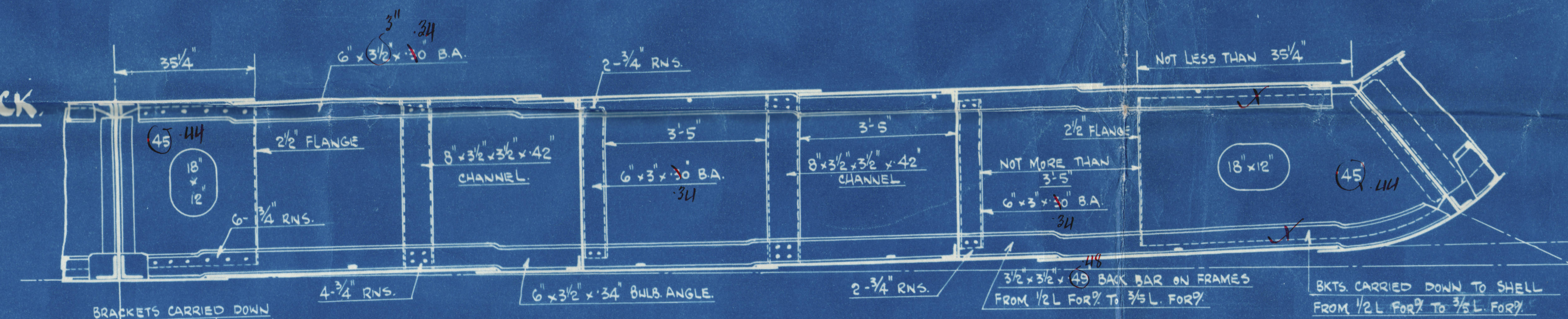
RIVETING SIDE FRAMING

SIDE FRAMES TO SHELL RINGS SPACED $6\frac{1}{2}$ DIAM. APART CR/ TO CR/ (SEE ALSO PAINTING ARRANGEMENT)

SIDE FRAMES TO SHELL IN PEAKS & DEEP TANKS 5 1/2 DIAS APART CR. TO CR

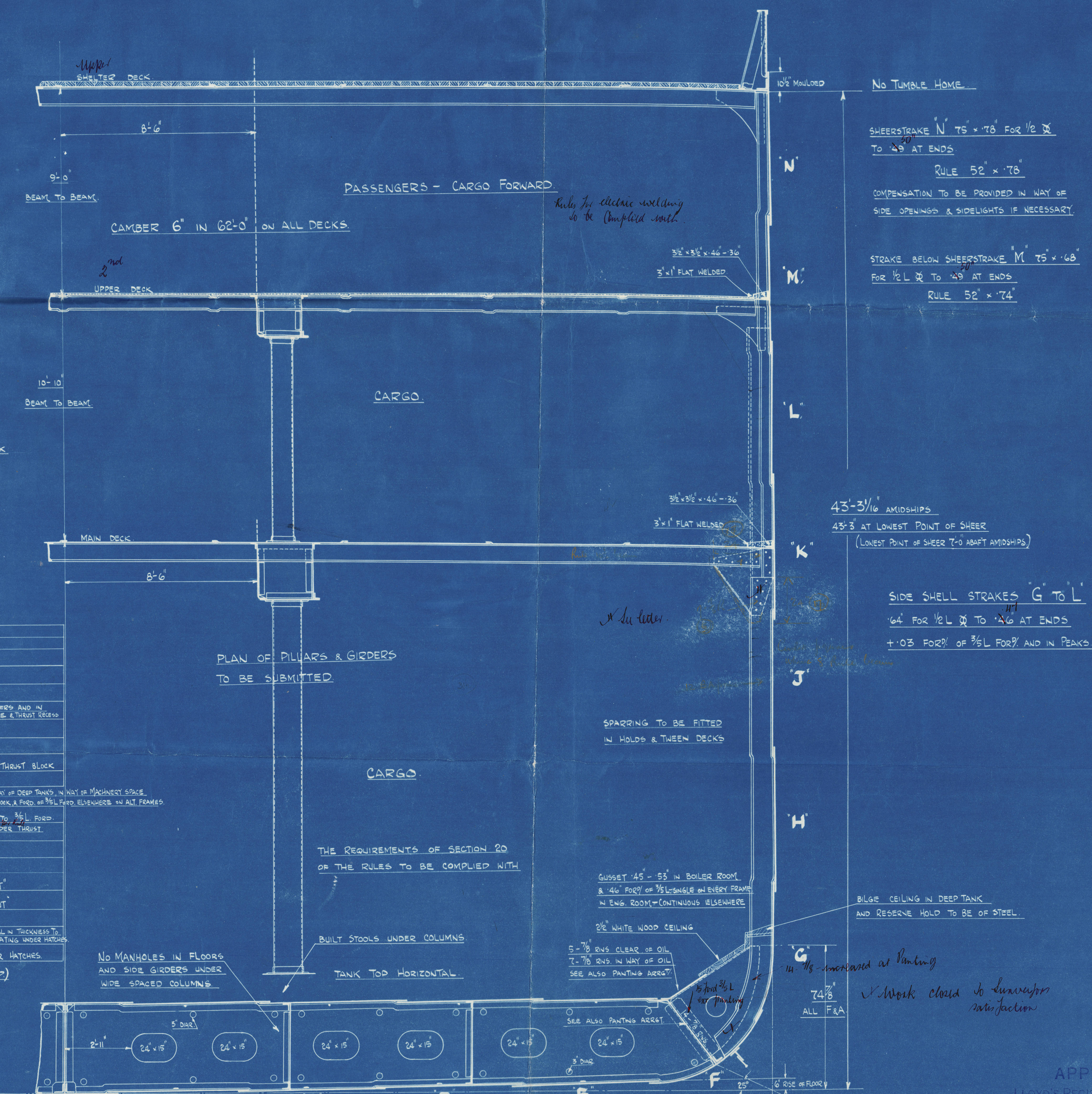
DOUBLE BOTTOM SCANTLING									
ITEM	1/2 LENGTH		DOUBLE BOTTOM		AT END		M. FITTED	REMARKS	
	RULE	AS FITTED	DOUBLE BOTTOM	DOUBLE BOTTOM	RULE	AS FITTED			
CENTER GIRDERS	4 1/2 x 9.58		64		50				
"	BOTTOM ANGLES	5 x 9.58	48 IF NO COMB		54		54	DOUBLE ALL FORE & AFT	
"	TOP ANGLES	3 1/2 x 9.58	60		48		48	DOUBLE ALL FORE & AFT	
"	VERT. ANGLES	3 1/2 x 9.49	58	58	48	48	48	FOUR UNDER BULGE BEAKERS AND 1 UNDER 1/2 INCH OF MACHINERY SPACE AT EACH BEAM	
SIDE GIRDERS	4 x 11		52		47	47	42	45 IN ENGINE ROOM	
"	BOTTOM ANGLES	3 1/2 x 9.58	48 IF NO COMB		48		48	DOUBLE UNDER MACHINERY SEATS & THRUST BLOCK	
"	TOP ANGLES	3 x 9.49	58	58	48	48	48	5/8" UNDER 1/2 INCH	
"	VERT. ANGLES	3 x 9.43	58	58	48	48	44	5/8" UNDER 1/2 INCH	
FLOORS	4 x 14		52		45		44	5/8" UNDER 1/2 INCH	
BOTTOM FRAMES	3 1/2 x 9.49		58		48		48	5/8" UNDER 1/2 INCH	
BOTTOM REIN. FRAMES	3 x 9.49		58		48		48	5/8" UNDER 1/2 INCH	
TANK MARGINS	4 1/2 x 7 x 28		54	54	58	58	58	5/8" UNDER 1/2 INCH	
"	SHELL BARS	3 1/2 x 9.58	52	52	48	48	48	5/8" UNDER 1/2 INCH	
"	VERT. LUGS OUTSIDE	6 x 9.58	48	48	48	48	48	SEE ALSO "PAINTING ARRANGEMENT"	
"	VERT. LUGS INSIDE	6 x 9.49	48	48	48	48	48	SEE ALSO "PAINTING ARRANGEMENT"	
WING BRACKETS	4 x 6		50		46		46	FLANGED 3/4" ON FACE	
TANK TOP OR STRONG	7 x 9 x 56		60		48		48	5/8" IN ENGINE ROOM AT LEAST EQUAL IN THICKNESS TO TANK TOP PLATING UNDER MATE	
TANK TOP PLATING	48 x 58		54		45		45	5/8" IN ENGINE ROOM AT LEAST UNDER HATCHES	
NOTE - W.T. FLATS IN DOUBLE BOTTOM INCREASED .08 IN THICKNESS & STIFFENED ON 5 1/2 x 5 x 30 B.A. (OVERALL 4" ABG. TANK TOP)									

SPACING RINGS - BOTH PLAINES SPACED 2 INCHES APART OR TO CR.
 FRAMES - RINGS IN BOTH PLAINES SPACED 2 INCHES APART OR TO CR.
 FRAMES - RINGS IN BOTH PLAINES SPACED 2 INCHES APART OR TO CR.
 RINGS - FRAMES - RINGS IN BOTH PLAINES SPACED 2 INCHES APART OR TO CR.
 CR. OR 200R BOTTOM BARS - RINGS IN BOTH PLAINES SPACED 5 INCHES APART OR TO CR. AND TO SUBVEENES 5
 CR. OR 200R TOP BARS - RINGS IN BOTH PLAINES SPACED 2 INCHES APART OR TO CR. EXCEPT WHERE NOTED.
 CR. OR 200R VERTICAL ANGLES - RINGS IN BOTH PLAINES SPACED 5 INCHES APART OR TO CR. EXCEPT WHERE NOTED.
 CR. OR 200R SIDE GIRTHS - RINGS IN BOTH PLAINES SPACED 2 INCHES APART OR TO CR.
 TIE BAR - RINGS IN BOTH PLAINES SPACED 42 INCHES APART OR TO CR.



BRACKET FLOORS ON ALTERNATE FRAMES CLEAR OF
DEEP TANKS, MACHINERY SPACE, THRUST SEATING, BOILER ROOM,
AND OF 40% OF $\frac{3}{4}$ L 40%.

FORECASTLE SIDE PLATING (44) 42"
EDGE LAPS 12 - END LAPS 12.



NO TUMBLE HOME.

SHEERSTRAKE N' 75" x 10" FOR 1/2 Q
TO 49' ^{50"} AT ENDS.

RULE 32 A TO
COMPENSATION TO BE PROVIDED IN WAY OF
SIDE OPENINGS & SIDELIGHTS IF NECESSARY

STRAKE BELOW SHEERSTRAKE "M" 75' x .68
FOR 1/2 L Q TO 49' AT ENDS
RULE 52' x .74'

$43'-3\frac{1}{16}"$ AMIDSHIPS
 $43'-3"$ AT LOWEST POINT OF SHEER
 (LOWEST POINT OF SHEER 7'-0" AFT AMIDSHIPS)

SIDE SHELL STRAKES "G" TO "L"
 .64" FOR $\frac{1}{2}L$ \times TO \times AT ENDS
 + .03 FOR $\frac{1}{2}$ OF $\frac{3}{5}L$ FOR $\frac{1}{2}$ AND IN PEAKS

BILGE CEILING IN DEEP TANK
AND RESERVE HOLD TO BE OF STEEL.

Work closed to Sunray for satisfaction

✓
Messrs. Barclay Curle & Co Ltd

RETAIN

656

Yard No 656

Amended Midship Section ✓

"City of Benares"

GLASGOW REPORT No. 57455

"City of Benares"

GLASGOW REPORT No. 57571

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Lloyd's Register
Foundation
W369-0125

Barclay Curle & Co Ltd

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"City of Benares"

Midships Section

(As built)

GLASGOW REPORT No. 57571

RETAIN

W369-0123 -



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LIST OF OWNERS: ADDITIONAL SCANTLINGS
OVER RULE REQUIREMENTS.
WHERE INCREASED SCANTLINGS ARE REQUIRED BY RULES
THE INCREASES BELOW ARE FURTHER ADDITIONAL.

DOUBLE BOTTOM:
SINGLE RIVETED DECK TOP BARS ARE TO BE FITTED ON EVERY FLOOR UNDER DECK TANK, THRUST RECESS, ENGINE ROOM AND BULKY ROOM. CEILINGS TO BE FITTED ON TANK TOP IN WAY OF AND TWO FEET BEYOND THE SQUARE OF THE HATCHES BUT THE PLATING & RIVETING IS TO BE INCREASED TO RULE REQUIREMENTS AS FOR WITHOUT CEILING.

FRAMING:
10' ON THICKNESS OF FORE PEAK FRAMED.
FLOORS IN FORE PEAK INCREASED IN 1" IN
DEEP KNEES ON LOWER IN 1" IN PEAK.

SHIELD PLATING
ON THICKNESS OF SHIELD PLATING
0.2" SHIELD PLATING
0.4" SHIELD PLATING
IN FUTURE JERN AND PLATING
ON SHIELD PLATING TO BE SUBSTITUTED IN WAY OF THE MID-
SHIP DECKHEAD FRONT BULKHEAD AND RIVETING TO BE
HYDRAULIC FOR ABOUT 10 FEET LONG AND 10 FEET HIGH
THIS BULKHEAD.

BULKHEADS:
'04" IN THICKNESS OF BOTTOM STRAKE OR STOKHOLD
BULKHEAD (ABOUT 4'0" ABOVE TANK TOP) AND STIFFENERS
HEAVILY BRACKETED TO TANK TOP AND TO DECK.

TUNNEL:
SHAFT TUNNEL TO BE SHEATHED WITH 9" J SPRUCE BUT
PLATING UNDER HATCHWAYS IS TO BE INCREASED TO RULE
REQUIREMENTS AS FOR WITHOUT SHEATHING.

MWD DIRT - 475'0" - 62'4" - 43'3 1/2" TO SHELTER DK. (LOYDS UPPER DK)

SCALE 1/2" = 1 FOOT

CLASS 100A1, WITH FREEBOARD CORRESPONDING
TO A SUMMER MOULDED DRAFT OF 28'4"

LOWEST POINT OF SHEER: 43'-3"

$$\begin{aligned} L \times D &= 469.1 \times 41.25 = 19350.4 \\ L \times [B \div D] &= 469.1 \times [6839 \div 41.25] = 48590.0 \\ H/D &= 41.25 \\ 41/D \text{ TO SHELTER / DK} &= 473.0 / 4520 = 10.43 \\ "d" &= 19.53 \end{aligned}$$

24' IN PEAKS : 27' FORD. OF 3/5 L. TO
COLLISION BND. 30 SPACING ELSEWHERE.
RULE SPACING 33 1/8'

STEM. $10\frac{5}{8} \times 2\frac{3}{4}$: STERNFRAME ($11\frac{1}{8} \times 9$ " RULE) FITTED STEEL CASTING

CAMBER 6" IN 6'-4" ON ALL DECKS UP TO SHELT² D.
3" PROMENADE & BOAT DECKS.

SEE ALSO LIST OF OWNERS' ADD'L REQUIREMENTS.
THE SCANTLINGS DETAILED ON THIS PLAN DO NOT
INCLUDE THE OWNERS' ADDITIONAL REQUIREMENTS.

SPARRING :- VERTICAL SPARRING TO BE CARRIED FORWARD AND AFT ATTACHED TO 3" x 1/4" PLAT BARS WITH CORNER BOLTS, HAVING ROUND HEADS WITH SQUARE SHOULDER UNDER HEADS AND SQUARE NUTS. TO BE 12" CLEAR OF DECK AT TOP AND 6" CLEAR OF CEMENT BAR OR BILGE CEILING AT BOTTOM.

ALL SPARRING PLANED AND CHAMFERED.

BRACKET FLOORS ON ALTERNATE FRAMES CLEAR OF
DEEP TANKS MACHY. SPACE THRUST SEATING BOILER
ROOM AND FORWARD OF 1/2L. FORWARD.

SHEERSTRAKE 'N'
75' x 78' FOR 424.2
TO 50' AT ENDS =
RULE 52' x 78' = 75' x 89'
COMPENSATION TO BE PROVIDED IN
WAY OF JOE OPENINGS AND
SIDELIGHTS IF NECESSARY.
including
front window

75 * 68 For Vel. &c.
To 50 at ends.
RULE 52 * 74.

$= 75 \times .72$
including own
increase

CARGO

Lammell Laird & Co's
Engines 2193

Arrangement of Gear Wheel,
Pinions & Rotors

S. S. "City of Benares"

LIVERPOOL

Report No. 107460

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W369-0124

SKETCH SHEWING ARRST OF GEAR WHEEL, PINIONS & ROTORS.
ONE SET COMPLETE AS DRAWN.

SERVICE SHP = 6600 @ 92 R.P.M. FOR GEAR WHEEL, 1814 R.P.M. FOR ALL PINIONS.

OVERLOAD SHP = 7260 @ 95 " " " " 1872 " " " "

MAX. AST^N SHP = 4650

H.P., I.P. & L.P. AHEAD TURBINES ARE ALL DESIGNED TO DEVELOP EQUAL POWERS, I.E. 2200 SHP, ON SERVICE.

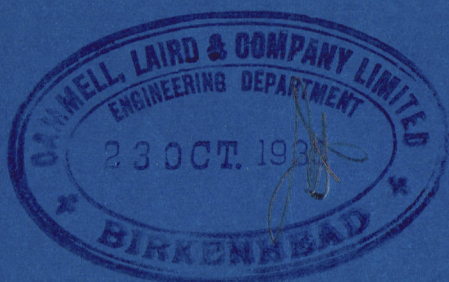
MATERIALS:- ROTOR SHAFTS: FORGED STEEL. U.T.S. 34-38 TONS/IN². ELONG^T 23%. BENDING ANGLE 180°.

PINIONS: OIL HARDENED & TEMPERED NICKEL STEEL. NICKEL 3.25% TO 3.75%, CARBON .27% TO .35%. U.T.S. 40 TO 45 TONS/IN². ELONG^T 23% LONGITUDINAL & 16% TRANSVERSE. BENDING ANGLE 180°.

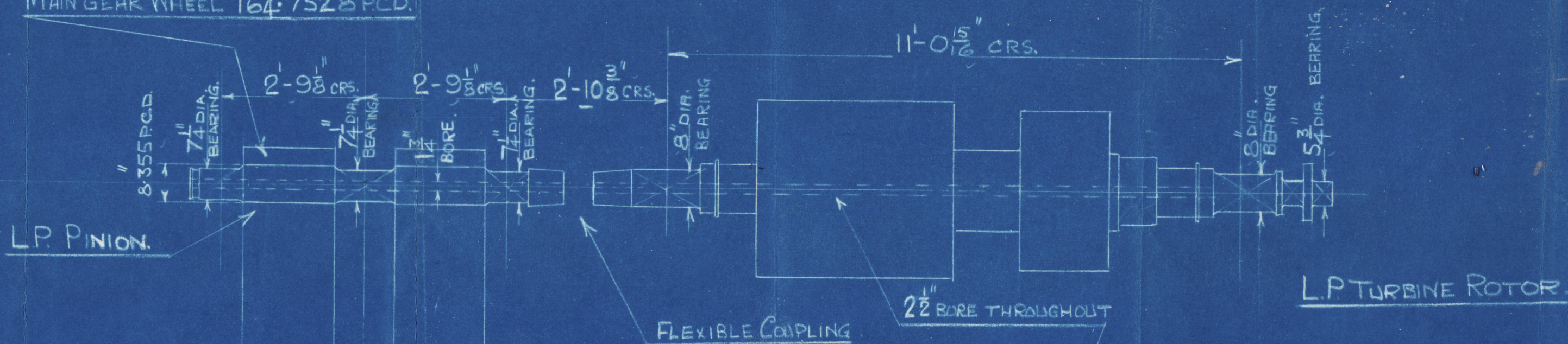
GEAR WHEEL SHAFT & RIMS: FORGED STEEL. U.T.S. 31-35 TONS/IN². ELONG^T 26%. BENDING ANGLE 180°.

THE MATERIAL IN ALL RESPECTS TO BE EQUAL TO B.O.T. & LLOYDS REQUIREMENTS.

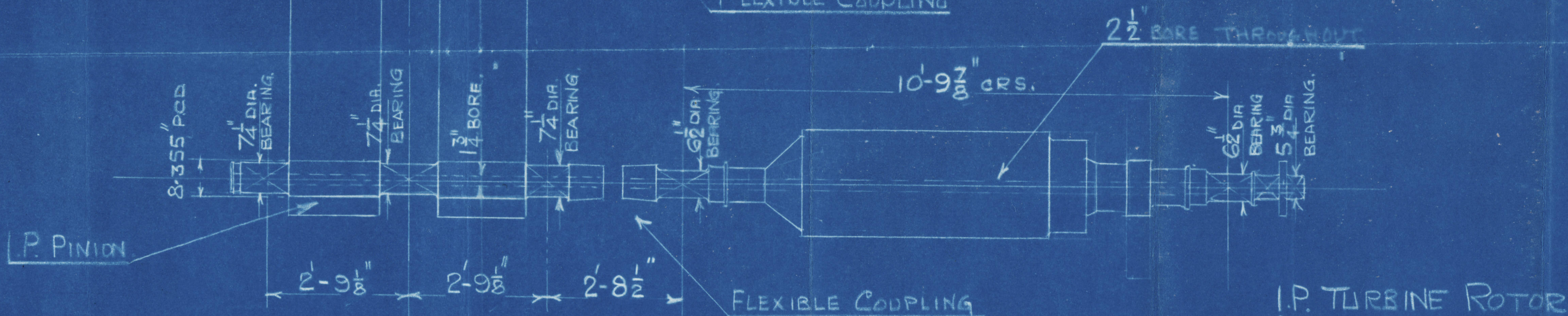
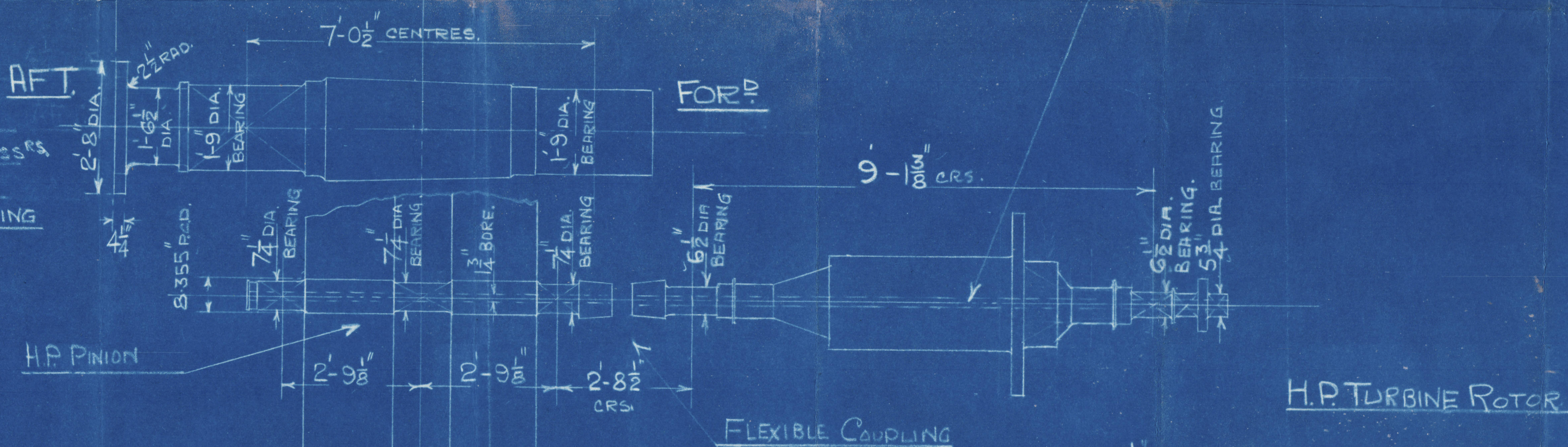
B9533



MAIN GEAR WHEEL 164.7528 PCD.



BOLTING WILL BE
SUBMITTED BY MESSRS.
BARCLAY CURLE
FOR ALL SHAFTING



DRAWN BY R.M. 21-10-35
CHECKED BY. QHR 22-10-35

SCALE: 1/2" = 1 FOOT

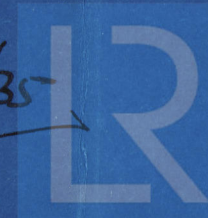
ENGINES N° 2193

ENGINES N° 2193.



W.J.F.
29/10/35

J.M.
24/10/35



Lloyd's Register
Foundation
0369-0124

Barclay Curle & Co

6656

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Plan of boilers

City of Benares

GLASGOW REPORT No. 57571

71

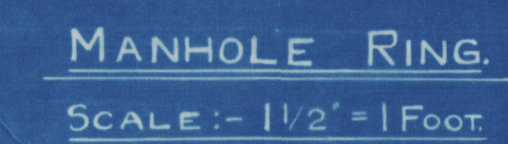
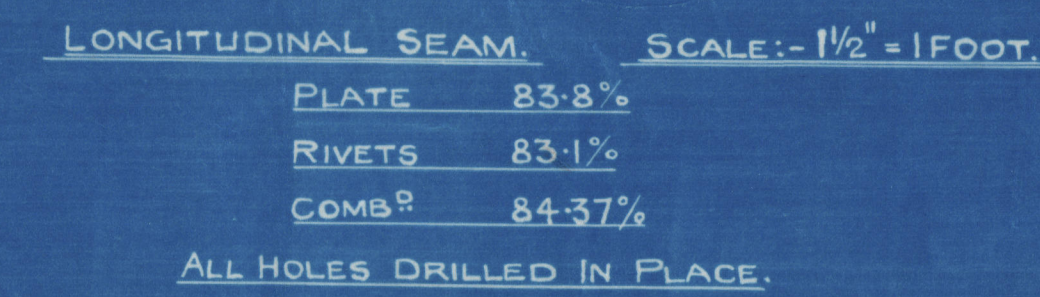
Barclay Curle & Co
Boilers No 656
City of Benares



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W369-0120



HEATING SURFACE OF TUBES	2590
" " " FURNACES, ETC.	550
TOTAL	3,140 x 5 = 15,700 SQ. FT.

TUBES OF PLAIN BEADED IRON, 3" EXT DIA (404 TOTAL PER BOILER)
PLAIN TUBES 3" EXT DIA (316 AT FRONT ENDS) x N^o 7 W 6
STAY " 3" " FRONT ENDS SWELLED TO 3 1/2" EXT DIA &
BOTH ENDS SOWNED 9 THREADS/INCH, CONTINUOUS THREADS
MARKED THEN 5 TO BE 6" THICK NETT SECTION 2447 0"
" " X " " 7/16" " " " 25673 0"
" " T " " 1/2" " " " 32723 0"
BACK ENDS OF ALL TUBES TO BE BEADED OVER.

16'-6" INT. DIA. x 12'-6" MEAN LENGTH, TO PASS BOARD OF TRADE & LLOYDS REQUIREMENTS & TESTS FOR A WORKING PRESSURE OF 275 LBS./SQ. IN. 5'-0" OFF REQUIRED. SCALE: 1" & 1/2" = 1' 00 FT.

DATE	DRAWN BY	TRACED BY	CHECKED BY	ISSUE TO:-	DRAWING NO
29.8.35		I. G. E. M. G. & E. W. G.		B. S. D. B.	31